

FIG. 1A-1
FIG. 1A-2

FIG. 1A

glatticato oaacagagag galcgagga ggcggccct ctagctccclg gtaggagga ctagggagtc agaglcagac ccigactggc lpgggcgagg cgctcgagt cagcATGGAA
 n E 120
 AGTCTGCG GGGTCTTGGT ATTCTGCTG CTGGCTCAG GACTGCCGT CAGGGCGGCC AAGCGTTCC GTGATGTCTT GGGCCATGAG CAGTATCCG ATCAGTCAG GGAGACAC
 S L C G U L U F L L L A A G L P L Q A A K R F A D U L G H E Q Y P D H N A E N H 240
 CATTTACCTG CCTGGCTTC AGRATGAAAT GATTGGATG AACACCTCTA TCCAGTGTGG AGGAGGGAG AGGGCAGATG GAGGACTCC TGGGAGGAG GCCGTGTGCA GGCAGCCCTA 360
 Q L A G U S D E H E U D E Q L Y P U U A A G E G A U K D S U E G G R U Q A R L
 ACCAGTATT CACCGCCCTT GGTGGGTTC AATATCCT TCTAGTGA CTTGGTCTT CCCAGTCCC AGAGGAGAGA TGCACGGC AATATCTCT ATGAGAGGAA CTCAGAGGT 480
 T S D S P A L U G S N I T F U V N L U F P A C Q K E D A H G H I U Y E R N C R S
 GATTGGAGC TGGCTTCTA CCCGTATGC TACACTGA CCACAGGGGC AGACGATGAG GACTGGCAG ACACACCCAG CCAGGCCAG CACCTCAGT TCCCGACGG GAGGCCCTC 600
 D L E L A S D P Y U Y N U T T G A D D E D U E D N T S Q G Q H L R F P O G K P F
 CCTCGCCCC ACAGAGGAA GAATGGAG TCTCTACG TCTTCACAC ACTTGGTCAG TATTTTCAA AGCTGGCTCA GTCTTACGA CAGTTTCTA TAAACACAGT CACCTTGA 720
 P R P H G R K U H F U Y U F H T L G Q Y F Q K L G Q C S A A U S I H T U H L T
 GTTGGCCCTC AGGTATGA AGTATTGTC TTTCAGAC ACAGGGCGGC ATACATCCC ATCTCCAG TGAAGACCT GTATGTGATA ACAGATCAGA TCCCTATATT CGTGACCATG 840
 U G P Q U N E U I U F A R H G A Y I P I S K U K D U Y U I T D Q I P I F U T H
 TACAGAGA ATGACCGGAA CTCTCTGT GAACCTTCC TACAGACCT CCCCATTTT TCGATGTC TCAATCACA TCCAGTCA TCCCTCAGT ACCTGCCAT TCCCTACAG 960
 Y Q K H D R N S S D E T F L A D L P I F F D U L I H D P S H F L N Y S A I S Y K

FIG. 1A-1

TGRACCTTG GGGACACAC TGGCTGTCTT GCTCCACCA ATCACACTTT GATACACCG TATGTGCTCA ATGGARCTT CACCTTTAC CTCACCTGCC AACCTGCAT GCCGGGACCA 1080
 U M F G D M T G L F U S H N H T L N H T Y U L N G T F M F N L T U Q T A U P G P
 TGGCCCTCAC CCACCCCTTC GCTCTCTCT TGCACCTTC CTCGCCCTG ATCTGGCTT TCACCCCAT TATCACCC TAGTCCCTCT TTAATGCCA CTCGCTACAA ATCATGGAG 1200
 C P S P T P S S S T S P S P A S S P S P T L S T P S P S L N P T G Y K S N E
 CTGAGTACA TTTCATAGA AACCTGCCA ATACAGAT ATGGTACTT CAGAGCCACC ATCACATTC TACATGGAT CTTAGAGTC AACATCATCC AGGTACAGA TGTCCCAATC 1320
 L S D I S N E H C R I M R Y G Y F A R A T I T I U D G I L E U H I I Q U A D U P I
 CCCACACTGC ACCCTGACAA CTCATCTATG GACTTCATTC TGACCTGCAA AGGGGCCACT CCCAGCGAGC CCGTAGCAT CATCTCTGAC CCCACCTGCC AGATCGCCCA GACACGGGTG 1440
 P T L Q P D N S L N D F I U T C K G A T P T E A C T I I S D P T C Q I A Q M R U
 TCGAGCCCG TGGCTGTGGA TGAGCTGTGC CTCTGTGCG TGAGGAGAGC CTTCATGGG TCCGGCCAGT ACTGTGTGAA TTTCACCTCG GGACACGATG CAGCCCTGCC CCTCACACGC 1560
 C S P U A U D E L C L L S U R R A F H G S G T Y C U M F T L G D D A S L A L T S
 GCCCTGATCT CTATCCCTGG CAAGACCTA GGCCTCCCTC TGAGACAGT GATGTGTG CTCATCTCCA TTGGCTGCTT GGCCATGTTT GTCACCATGG TTACCATCTT CCTGTACAA 1680
 A L I S I P G K D L G S P L A T U H G U L I S I G C L A M F U T M U T I L L Y K
 AACACACAGA CGTACAGCC AATAGGAAC TGCACCCAGA ACGTGTGTA GGGCAGAGC CTGAGTGTCTT TTCTCAGCCA TGCARAGGC CCGTCTCTCC GAGGACATCC GGAACAGCAT 1800
 K H K T Y K P I G H C T R N U U K G K G L S U F L S H A K A P F S A G D R E K D
CCACTGTCC AGCACACCC ATGGATGCTC TATgtcttca ctctcaeltc tgcctggaa cccactctc tgtgcctgta tglgcctgt ggcgaaglac atgaclggta gctgtgttt 1920
 P L L Q D K P U N L .
 tctacggatt attgtaaaat gtatcatg gtlttagggg tglaglttao tggcatttta glgaaggat ggggaagacag taattctteg catctgtatt gtgtttttta taactgtao 2040
 agggtaggca catlgtlct gaaggggggg ggggggggta ctgtactta aggtctagg ttaactggga gaggatgcc cagctcctt agattctac acaagatglt cctgaaccca 2160
 gctgtlcttg acctaaaggc catgtlcat caactctatc tcaagctcatt gaacatacct gaggcgctga tgaattata atggaaccaa gcttgttgta tggltgtgt gtgtacata 2280
 gatactcatt aaaaagacag tctattaaaa aaaaaaoooo 2320

FIG. 1A-2

EXON	BAC Start	BAC Stop	cDNA Start	cDNA Stop	Exon Length
1	83294	83455	1	162	162
2	89834	89986	163	314	152
3	90696	90839	315	458	144
4	93419	93594	459	634	176
5	96509	96665	635	791	157
6	96983	97300	792	1109	318
7	103044	103142	1110	1208	99
8	104413	104515	1209	1311	103
9	106494	106702	1312	1520	209
10	110048	110141	1521	1614	94
11	110592	111633	1615	2656	1042

poly A signal is position 111614-111619

translation start (ATG) is:

cDNA: 92

Gene: 83385

FIG. 1B

K-D

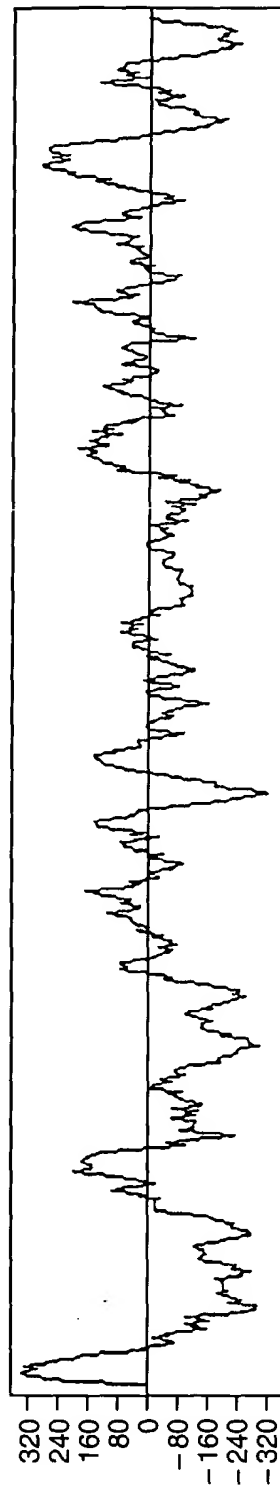


FIG. 1C

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FIG. 2A-1
FIG. 2A-2
FIG. 2A-3
FIG. 2A-4
FIG. 2A-5

FIG. 2A

rat	ATGGAAGTC	TCTGGGGGT	CCTGGTATTT	CTGCTGCTGG	CTGCAGGACT	GCCGCTCCAG	GCGGCAAGC	GGTTC	75
mouse	ATGGAAGTC	TCTGGGGGT	CCTGGGATTT	CTGCTGCTGG	CTGCAGGACT	GCCTCTCCAG	GCTGCCAAGC	GATTT	75
human	ATGGAAGTC	TCTACTATTT	CCTGGGATTT	CTGCTCCTGG	CTGCAAGATT	GCCACTTGAT	GCCCCAAC	GATTT	75
rat	CCTGATGTGC	TGGGCCATGA	GCAGTATCCG	GATCACATGA	GGGAGAACAA	CCAATTACGT	GGCTGGTCTT	CAGAT	150
mouse	CCTGATGTGC	TGGGCCATGA	ACAGTATCCC	GATCACATGA	GAGAGCACAA	CCAATTACGT	GGCTGGTCTT	CGGAT	150
human	CATGATGTGC	TGGGCAATGA	AAGACCTTCT	GCTTACATGA	GGGAGCACAA	TCAATTAAAT	GGCTGGTCTT	CTGAT	150
rat	GAAATGAAT	GGGATGAACA	GCTGTATCCA	GTGTGGAGGA	GGGGAGAGGG	CAGATGGAAG	GACTCCTGGG	AAGGA	225
mouse	GAAATGAAT	GGGATGAACA	CCTGTATCCA	GTGTGGAGGA	GGGGAGACGG	CAGGTGGAAG	GACTCCTGGG	AAGGA	225
human	GAAATGACT	GGAATGAAAA	ACTCTACCCA	GTGTGGAAGC	GGGGAGACAT	GAGGTGGAAG	AATCCTGGA	AGGGA	225
rat	GGCGTGTGC	AGGCAGCCCT	AACCAGTGAT	TCACCGGCCT	TGGTGGGTTT	CAATATCACC	TTTGTAGTGA	ACCTG	300
mouse	GGCGTGTGC	AGGCAGTCTT	GACCAGTGAC	TCACCGGCTC	TGGTGGGTTT	CAATATCACT	TTTGTAGTGA	ACCTG	300
human	GGCGTGTGC	AGGCGTCTCT	GACCAGTGAC	TCACCGAGCC	TCGTGGGCTC	AAATATAACA	TTTGGGTGA	ACCTG	300

FIG. 2A-1

rat	GTGTTCCCA	GATGCCAGAA	GGAAGATGCC	AACGGCAATA	TCGTCTATGA	GAGAACTGC	AGAACTGATT	TGGAG	375
mouse	GTGTTCCCA	GATGCCAGAA	GGAAGATGCT	AATGGCAATA	TCGTCTATGA	GAAGAACTGC	AGGAATGATT	TGGGA	375
human	ATATTCCCTA	GATGCCAAA	GGAAGATGCC	AATGGCAACA	TAGTCTATGA	GAAGAACTGC	AGAAATGAGG	CTGGT	375
rat	CTGGCTTCTG	ACCCGTATGT	CTACAACTGG	ACCACAGGGG	CAGACGATGA	GGACTGGGAA	GACAACACCA	GCCAA	450
mouse	CTGACATCTG	ACCTGCATGT	CTACAACTGG	ACTGCAGGGG	CAGATGATGG	TGACTGGGAA	GATGGCACCA	GCCGA	450
human	TTATCTGCTG	ATCCATATGT	TTACAACTGG	ACAGCATGGT	CAGAGGACAG	TGACGGGGAA	AATGGCACCG	GCCAA	450
rat	GGCCAGCACC	TCAGGTTCCC	CGACGGGAAG	CCCTTCCCTC	GCCCCCACGG	ACGGAAGAAA	TGGAACITCG	TCTAC	525
mouse	AGCCAGCATC	TCAGGTTCCC	GGACAGGAGG	CCCTTCCCTC	GCCCCCATGG	ATGGAAGAAA	TGGAGCTTTG	TCTAC	525
human	AGCCATCATA	ACGTCTTCCC	TGATGGGAAA	CCTTTTCCCTC	ACCACCCCGG	ATGGAGAAGA	TGGAATTTCA	TCTAC	525
rat	GTCTTCCACA	CACCTTGGTCA	GTATTTTCAA	AAGCTGGGTC	AGTGTTCAGC	ACGAGTTTCT	ATAAACACAG	TCAAC	600
mouse	GTCTTTCACA	CACCTGGCCA	GTATTTCCAA	AAACTGGGTC	GGTGTTTCAGC	ACGGGTTTCT	ATAAACACAG	TCAAC	600
human	GTCTTCCACA	CACCTTGGTCA	GTATTTCCAG	AAATTGGGAC	GATGTTTCAGT	GAGAGTTTCT	GTGAACACAG	CCAAT	600
rat	TTGACAGTTG	GCCCTCAGGT	CATGGAAGTG	ATTGTCCTTC	GAAGACACGG	CCGGGCATAC	ATTCCCCTCT	CCAAA	675
mouse	TTGACAGCTG	GCCCTCAGGT	CATGGAAGTG	ACTGTCCTTC	GAAGATACGG	CCGGGCATAC	ATTCCCCTCT	CGAAG	675
human	GTGACACTTG	GGCCTCAACT	CATGGAAGTG	ACTGTCATCA	GAAGACATGG	ACGGGCATAT	GTTCCCCTCG	CACAA	675

FIG. 2A-2

rat	---CCACAT	TATCAACACC	TAGTCCCTCT	TTAATGCCTA	CTGGCTACAA	ATCCATGGAG	CTGAGTGACA	TTTCC	1101
mouse	TTGCCCCACAT	TATCAACACC	TAGCCCTCT	TTAATGCCTA	CTGGTTACAA	ATCCATGGAG	CTGAGTGACA	TTTCC	1107
human	-----CACC	-----CACC	-----CCTTCT	TTAGGACCTG	CTGGTGACAA	CCCCCTGGAG	CTGAGTAGGA	TTTCT	1059
rat	AATGAAAAC	GCCGAATAA	CAGATAAGGT	TACTTCAGAG	CCACCATCAC	AATTGTAGAT	GGAAATCCTAG	AAGTC	1176
mouse	AATGAAAAC	GCCGAATAA	CAGATAAGGC	TACTTCAGAG	CCACCATCAC	AATTGTAGAG	GGATCCTGG	AAGTC	1182
human	GATGAAAAC	GCCAGATTAA	CAGATAAGGC	TACTTTCAAG	CCACCATCAC	AATTGTAGAG	GGAAATCTTAG	AGGTT	1134
rat	AACATCATCC	AGGTAGCAGA	TGTCCCAATC	CCCACACTGC	AGCCTGACAA	CTCACTGATG	GACTTCATTG	TGACC	1251
mouse	AGCATCATGC	AGATAGCAGA	TGTCCCCATG	CCCACACCGC	AGCCTGCCAA	CTCCCTGATG	GACTTCACTG	TGACC	1257
human	AACATCATCC	AGATGACAGA	CGTCCTGATG	CCGGTGCCAT	GGCCTGAAAG	CTCCCTAATA	GACTTTGTGG	TGACC	1209
rat	TGCAAGGGG	CCACTCCCAC	GGAAGCCTGT	ACGATCATCT	CTGACCCCAC	CTGCCAGATC	GCCCAGAACA	GGGTG	1326
mouse	TGCAAGGGG	CCACCCCCAT	GGAAGCCTGT	ACGATCATCT	CCGACCCCAC	CTGCCAGATC	GCCCAGAACC	GGGTG	1332
human	TGCCAAGGGA	GCATTCCCAC	GGAGTCTGT	ACCATCATTT	CTGACCCCAC	CTGGGAGATC	ACCCAGAACA	CAGTC	1284
rat	TGCAGCCCG	TGGCTGTGGA	TGAGCTGTGC	CTCCTGTCCG	TGAGGAGAGC	CTTCAATGGG	TCCGGCACGT	ACTGT	1401
mouse	TGCAGCCCTG	TGGCTGTGGA	TGGCTGTGC	CTGCTGTCTG	TGAGAAGAGC	CTTCAATGGG	TCTGGCACCT	ACTGT	1407
human	TGCAGCCCTG	TGGATGTGGA	TGAGATGTGT	CTGCTGACTG	TGAGACGAAC	CTTCAATGGG	TCTGGGACGT	ACTGT	1359

FIG. 2A-4

rat	GTGAATTTCA	CTCTGGGAGA	CGATGCAAGC	CTGGCCCTCA	CCAGGCCCT	GATCTCTATC	CCTGGCAAAG	ACCTA	1476
mouse	GTGAATTTCA	CTCTGGGAGA	TGATGCAAGC	CTGGCCCTCA	CCAGCACCC	GATCTCTATC	CCTGGCAAAG	ACCCA	1482
human	GTGAACCTCA	CCCTGGGGGA	TGACACAAGC	CTGGCTCTCA	CGAGCACCC	GATTTCTGTT	CCTGACAGAG	ACCCA	1434
rat	GGCTCCCCTC	TGAGAACAGT	GAATGGTGT	CTGATCTCCA	TTGGCTGCCT	GGCCATGTTT	GTCACCATGG	TTACC	1551
mouse	GACTCCCCTC	TGAGAGCAGT	GAATGGTGT	CTGATCTCCA	TCGGCTGCCT	GGCTGTGCTT	GTCACCATGG	TTACC	1557
human	GCCTCGCCTT	TAAGGATGGC	AAACAGTGCC	CTGATCTCCG	TTGGCTGCTT	GGCCATATTT	GTCACCTGTA	TCTCC	1509
rat	ATCTTGCTGT	ACAAAAAACA	CAAGACGTAC	AAGCCAATAG	GAACTGCAC	CAGGAACGTG	GTCAAGGGCA	AAGGC	1626
mouse	ATCTTGCTGT	ACAAAAAACA	CAAGGCGTAC	AAGCCAATAG	GAACTGCCC	CAGGAACACG	GTCAAGGGCA	AGGGC	1632
human	CTCTTGGTGT	ACAAAAAACA	CAAGGAATAC	AACCCAATAG	AAAATAGTCC	TGGGAATGTG	GTCAAGAGCA	AAGGC	1584
rat	CTGAGTGTTT	TTCTCAGCCA	TGCAAAAGCC	CCGTTCTCCC	GAGGAGACCG	GGAGAAGGAT	CCACTGCTCC	AGGAC	1701
mouse	CTGAGTGTTT	TCCTCAGTCA	CGCGAAAGCC	CCGTTCTTCC	GAGGAGACCA	GGAGAAGGAT	CCATTGCTCC	AGGAC	1707
human	CTGAGTGCT	TTCTCAACCG	TGCAAAAGCC	GTGTTCTTCC	CGGAAACCA	GGAAAAGGAT	CCGCTACTC	---AA	1655
rat	AAGCCATGGA	TGCTCTAA--	-----	-					1719
mouse	AAGCCAAAGGA	CACCTCTAA--	-----	-					1725
human	AAACCAAGAA	---TTTAAAG	GAGTTTCTTA	A					1683

FIG. 2A-5

FIG. 2B-1
FIG. 2B-2

FIG. 2B

rat	MESLCGVLVF	LLLAAGLPLQ	AAKRFDRVLG	HEQYPDHMR	NNQLRGWSSD	50
mouse	MESLCGVLGF	LLLAAGLPLQ	AAKRFDRVLG	HEQYPDHMR	HNQLRGWSSD	50
human	MECLYYFLGF	LLLAARLPLD	AAKRFHDVLG	NERPSAYMR	HNQLNGWSSD	50
rat	ENEWDEQLYP	VWRRGEGRWK	DSWEGGRVQA	ALTSDSPALV	GSNITFVVNL	100
mouse	ENEWDEHLYP	VWRRGDGRWK	DSWEGGRVQA	VLTSDSPALV	GSNITFVVNL	100
human	ENDWNEKLYP	VWKRGDMRWK	NSWKGRVQA	VLTSDSPALV	GSNITFAVNL	100
rat	VFPRCQKEDA	NGNIVYERN	RSDLELASDP	YVYNWTTGAD	DEDWEDNTSQ	150
mouse	VFPRCQKEDA	NGNIVYEKNC	RNDLGLTSDL	HVYNWTAGAD	DGDWEDGTSR	150
human	IFPRCQKEDA	NGNIVYEKNC	RNEAGLSADP	YVYNWTAWE	DSDGENGTOQ	150
rat	GQHLRFPDCK	PFPRPHGRKK	WNFVYVFHTL	GQYFQKLGQC	SARVSINTVN	200
mouse	SQHLRFPDRR	PFPRPHGWKK	WSFVYVFHTL	GQYFQKLGRC	SARVSINTVN	200
human	SHNVFPDCK	PFPHHPGWR	WNFIYVFHTL	GQYFQKLGRC	SVRVSVNTAN	200
rat	LTVGPQVMEV	IVFRRHGRAY	IPISKVKDVY	VITDQIPIFV	TMYQKNDRNS	250
mouse	LTAGPQVMEV	TVFRRYGRAY	IPISKVKDVY	VITDQIPFV	TMSQKNDRNL	250
human	VTLGPQLMEV	TVYRRHGRAY	VPIAQVKDVY	VVTDQIPFV	TMFQKNDRNS	250
rat	SDETFLRDLP	IFFDVLIHDP	SHFLNYSALS	YKWNFGDNTG	LFVSNNHHTLN	300
mouse	SDEIFLRDLP	IVFDVLIHDP	SHFLNDSALS	YKWNFGDNTG	LFVSNNHHTLN	300
human	SDETFLKDLP	IMFDVLIHDP	SHFLNYSTIN	YKWSEGDNTG	LFVSTNHHTVN	300

FIG. 2B-1

rat	HTYVLNGTFN	FNLTVQTAVP	GPCPSPTPS-	-PSSSTSPSP	ASSPSPTLST	348
mouse	HTYVLNGTFN	LNLTVQTAVP	GPCPPPSPT	PPSPSTPPLP	SPSPLPTLST	350
human	HTYVLNGTFS	LNLTVKAAAP	GPCPPPPP--	-----PPRP	-----SK	334
rat	PSPSLMPTGY	KSMELSDISN	ENCRINRYGY	FRATITIVDG	ILEVNI IQVA	398
mouse	PSPSLMPTGY	KSMELSDISN	ENCRINRYGY	FRATITIVEG	ILEVSIMQIA	400
human	PTPSLGPAGD	NPLELSRIPD	ENCQINRYGH	FQATITIVEG	ILEVNI IQMT	384
rat	DVPIPTLQPD	NSLMDFIVTC	KGATPTEACT	IISDPTCQIA	QNRVCSPVAV	448
mouse	DVPMP TPQPA	NSLMDFTVTC	KGATPMEACT	IISDPTCQIA	QNRVCSPVAV	450
human	DVLMPPVPWE	SSLIDFVVTC	QGSIPTEVCT	IISDPTCEIT	QNTVCSPVDV	434
rat	DELCLLSVRR	AFNGSGTYCV	NFTLGDDASL	ALTSALISIP	GKDLGSPLRT	498
mouse	DGLCLLSVRR	AFNGSGTYCV	NFTLGDDASL	ALTSTLISIP	GKDPDSPLRA	500
human	DEMCLLTVRR	TFNGSGTYCV	NLTLGDDTSL	ALTSTLISVP	DRDPASPLRM	484
rat	VNGVLISIGC	LAMFVTMVTI	LLYKKHKTYK	PIGNCTRNVV	KGKGLSVFLS	548
mouse	VNGVLISIGC	LAVLVTMVTI	LLYKKHKAYK	PIGNCPRNTV	KGKGLSVLLS	550
human	ANSALISVGC	LAIFVTVISL	LVYKKHKEYN	PIENSPGNVV	RSKGLSVFLN	534
rat	HAKAPFSRGD	REKDPLLQDK	PW--ML	572		
mouse	HAKAPFFRGD	QEKDPLLQDK	PR--TL	574		
human	RAKAVFFPGN	QEKDPLLKNQ	EFKGVS	560		

FIG. 2B-2

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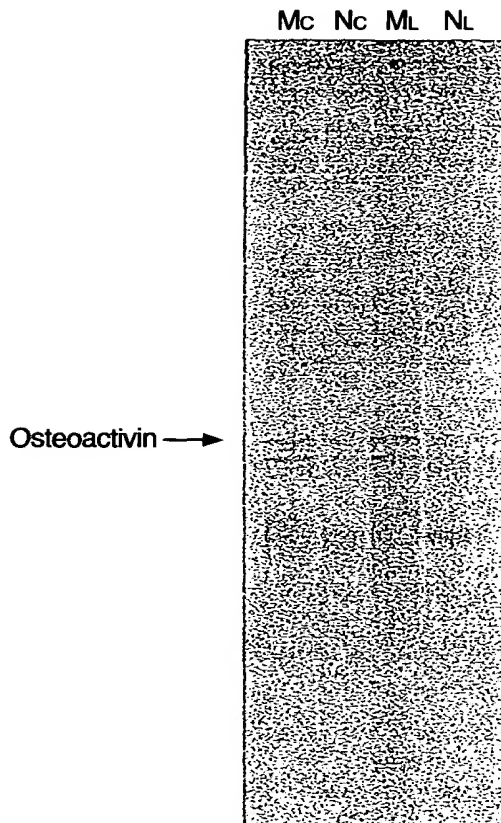


FIG. 3

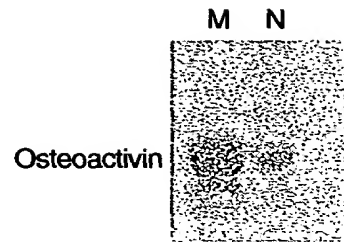


FIG. 4A

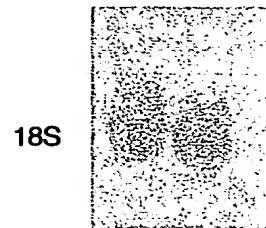


FIG. 4B

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FIG. 5



FIG. 5A

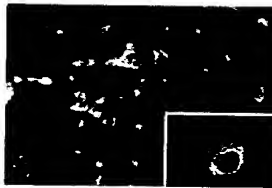


FIG. 5B



FIG. 5C

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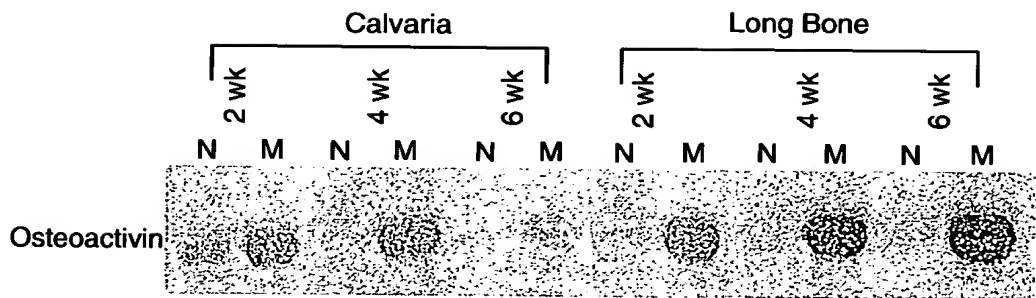


FIG. 6

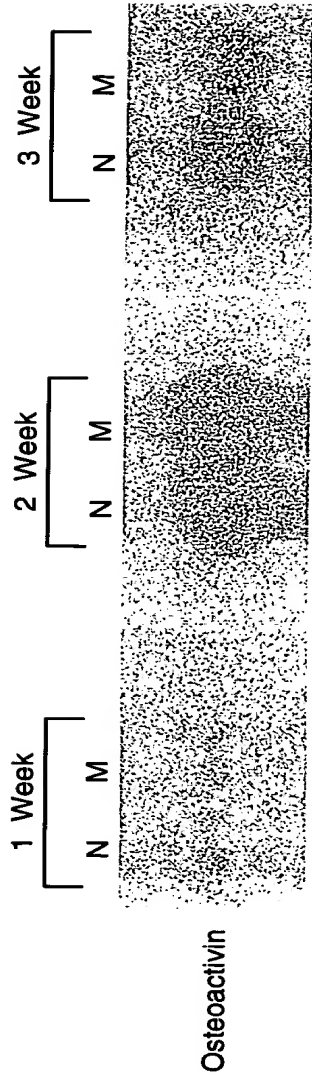


FIG. 7A

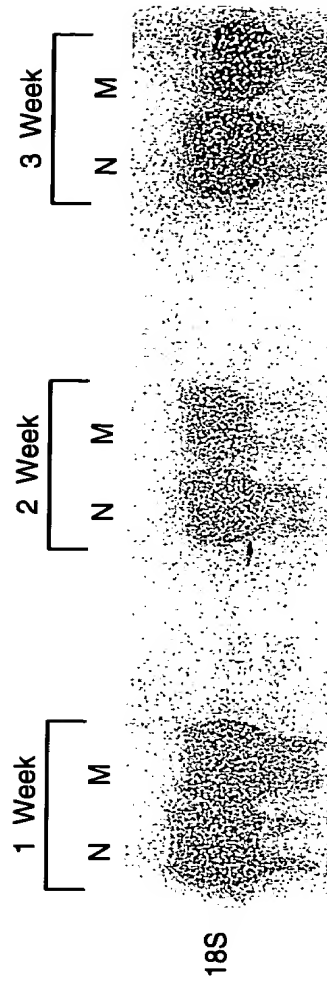


FIG. 7B

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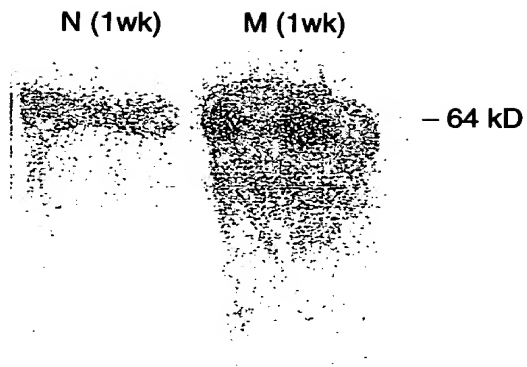


FIG. 8

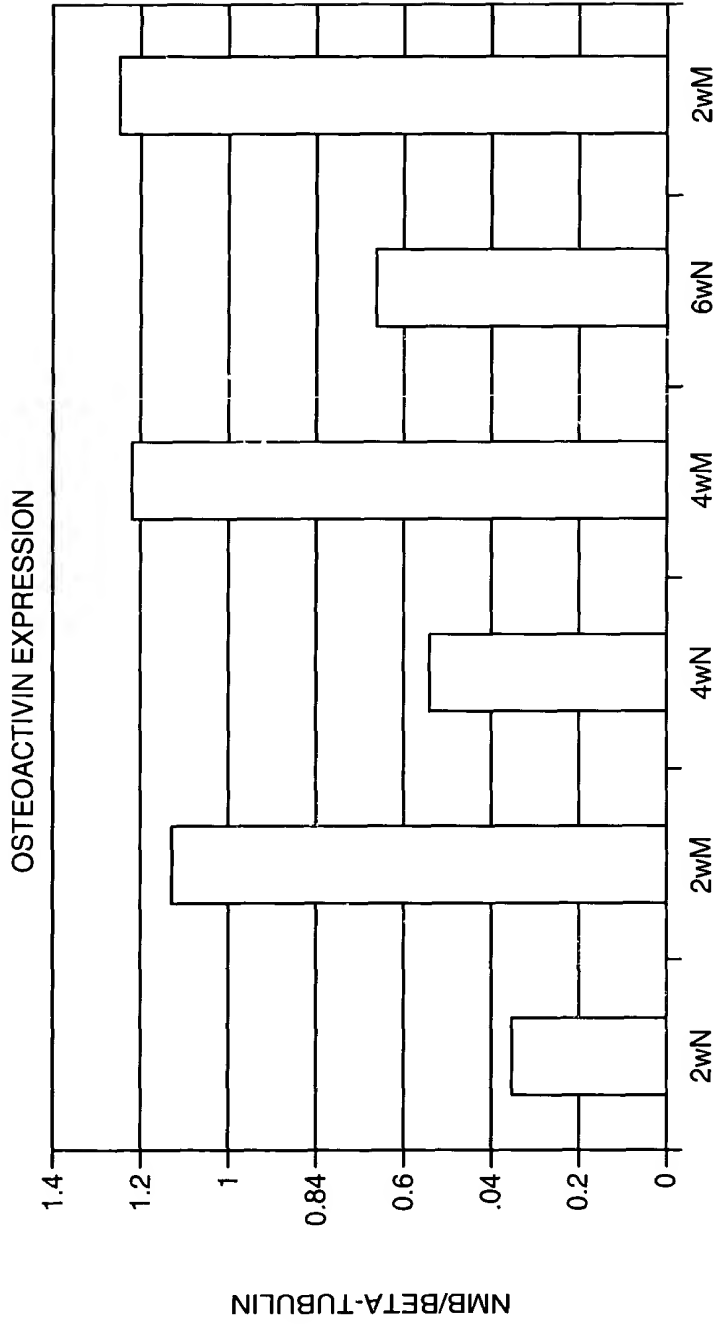


FIG. 9

LONG BONE

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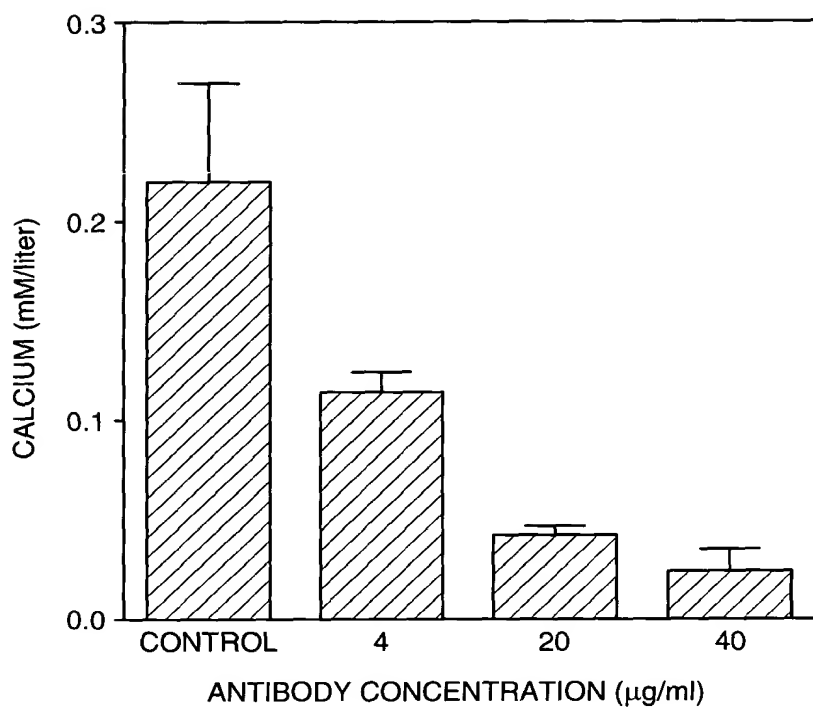


FIG. 10